Lakshya JEE 2.0 2026

Mathematics

Determinants

DPP: 1

Q1 The value of the determinant $\begin{vmatrix} 1 & \log_b a \\ \log_a b & 1 \end{vmatrix}$ is equal to:

(A) 1

(B) $\log_a b$

(C) $\log_b a$

(D) 0

Q2 If $\begin{vmatrix} -a^2 & ab & ac \\ ab & -b^2 & bc \\ ac & bc & -c^2 \end{vmatrix} = ka^2b^2c^2$, then k is equal to:

(A) 2 (B) 4

(C) -4 (D) 8

Q3 Let $ax^3 + bx^2 + cx + d = \begin{vmatrix} 3x & x+1 & x-1 \\ x-3 & -2x & x+2 \\ x+3 & x-4 & 5x \end{vmatrix}$ then the value of d is

(A) 5 (B) 0

(C) -6 (D) 4

Q4 If $\mathrm{A} + \mathrm{B} + \mathrm{C} = \pi$, then value of $\begin{vmatrix} \sin(A+B+C) & \sin B & \cos C \\ -\sin B & 0 & \tan A \\ \cos(A+B) & -\tan A & 0 \end{vmatrix}$ is

(A) 0

(B) 1

(C) $2\sin B \cdot \tan A \cos C$

(D) $2\sin A \sin B \cdot \sin C$

Q5 The value of $\begin{vmatrix} 5^2 & 5^3 & 5^4 \\ 5^3 & 5^4 & 5^5 \\ 5^4 & 5^5 & 5^6 \end{vmatrix}$, is

(A) 5^2

(B) 0

(C) 5^{13}

(D) 5^9

Q6 The value of $\begin{vmatrix} 11 & 12 & 13 \\ 12 & 13 & 14 \\ 13 & 14 & 15 \end{vmatrix}$, is

(A) 1 (B) 0

(C) -1 (D) 67

Q7 If $\begin{vmatrix} x^2+x & 3x-1 & -x+3 \\ 2x+1 & 2+x^2 & x^3-3 \\ x-3 & x^2+4 & 3x \end{vmatrix} = a_0 + a_1x + a_2x^2 + \ldots + a_7x^7$.

The value of a_0 is

(A) 25 (B) 24

(C) 23 (D) 21

Q8 Let $\begin{vmatrix} x^2+3x & x-1 & x+3 \\ x+1 & -2x & x-4 \\ x-3 & x+4 & 3x \end{vmatrix} = ax^4 + bx^3 + cx^2 + dx + e$ be an identity in x, where a, b, c, d, e are independent of x. Then the value of e is

(A) 4 (B) 0

(C) 1 (D) none of these

Q9

If $\begin{vmatrix} a & b & a\alpha+b \\ b & c & b\alpha+c \\ a\alpha+b & b\alpha+c & 0 \end{vmatrix} = 0$ then

(A) $a,\ b,\ c$ are in A.P.

(B) $a,\ b,\ c$ are in G.P.

(C) α is a root of $ax^2+2bx+c=0$

(D) $(x-\alpha)$ is a factor of $ax^2+2bx+c=0$

Q10 The roots of the equation

$\begin{vmatrix} x-1 & 1 & 1 \\ 1 & x-1 & 1 \\ 1 & 1 & x-1 \end{vmatrix} = 0$ are

(A) $1, 2$

(B) $-1, 2$

(C) $1, -2$

(D) $-1, -2$

Answer Key

Q1	(D)
Q2	(B)
Q3	(C)
Q4	(A)
Q5	(B)
Q6	(B)
Q7	(D)
Q8	(B)
Q9	(B, C, D)
Q10	(B)

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